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AUTHOR Burgess, Michael; And Others
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ABSTRACT

Columbus State Community College (CSCC) in Ohio has developed a process and model for assuring that technical programs and individual course outcomes meet the needs of the industries being served. Initially undertaken as part of a project with Honda of America to provide two new technology programs, the process included surveys of representative industries to determine required course outcomes or competencies, advisory committee review of the programs, personal contact with representatives, and two Designing a Curriculum (DACUM) processes to identify specific job skills and tasks appropriate for the program outcomes. The process was applied to the college's Graphic Communications program, with 30 companies representing the printing and publishing industries being surveyed. As a result of the process, it was determined that the program adequately matched the needs of the industry served and therefore was viable. The college has decided that the program validation process should be revisited every 3 years to maintain currency with the latest technology. Finally, the program validation process at CSCC provides a measure of performance for three of the nine service expectations endorsed by the Ohio Board of Regents in 1992, satisfying expectations related to providing technical programs that prepare individuals for employment in specific careers, establishing partnerships with industry and business, and establishing a high level of community involvement in decision-making processes. (TGI)

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A PROCESS FOR DETERMINING WHAT BUSINESS AND INDUSTRY WANT AND NEED FROM OUR GRADUATES

By

Michael Burgess
Dean, Engineering

Robert Queen
Chair, Graphic Communications

Andrew Rezin
Chair, Auto Technology

Columbus State Community College
Columbus, OH

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Robert L. Queen, *A.A.S., B. Sc., M.A.*
Mr. Queen is currently Chairperson of the Graphic Communications department. Prior responsibility has included direction and management of the Mechanical Engineering, Electromechanical Engineering, Quality Assurance Technologies and the Welding Technology programs. In addition to his program, management focus is on program development, validation, assessment, and expansion. Two new areas being pursued are Interactive Multimedia Technology and Telecommunications Engineering Technology including distance learning. Mr. Queen is President of the International Interactive Communications Society.

Prior to joining Columbus State Community College, he has held positions as Vice-President of Col-X Corporation; Manager, Engineering Quality Assurance, Dresser Industries; and a Research Scientist with Battelle Memorial Institute. Mr. Queen is a recipient of the A. F. Davis Silver Medal Award, for excellence of his paper in the field of Machine Design.

Additionally, Mr. Queen is a doctoral candidate at The Ohio State University in Vocational-Technical Education with a focus on entrepreneur leadership.

Andrew A. Rezin, *B. A., M. A.*
Andy Rezin has been Chairperson of Automotive Technology at Columbus State Community College since 1993 and has taught at the college since 1985. Prior to his current position he spent twenty years in management positions in industry. As a result of his extensive private sector management experience he has the dual perspectives of having been both a final consumer of the educational process as well as a direct educational provider. He has been involved in implementing continuous improvement programs in both industry and education.

Mr. Rezin is a graduate of the Crosby Quality College, has a B. A. in Marketing and Management from Kent State, an M. A. in Human Resource Development from The Ohio State University, and is currently a Ph. D. candidate in Comprehensive Vocational Education at The Ohio State University.

Michael L. Burgess, *B. A., M. A., Ph. D.*
Michael Burgess has been Dean of the Engineering Technologies division at Columbus State Community College since 1981. His advancing career in the field of Industrial Technology extends back to 1967. Dr. Burgess is the recipient of the Outstanding Secondary Educators of America Award and is listed in Who's Who in American Education. Dr. Burgess continues to be active in the development of innovative school programs. His most recent work deals with Strategic Environmental Assessment in Two-Year Community Colleges and Technical Institutes.

A Process for Determining What Business and Industry Want and Need From Our Graduates

Robert L. Queen, Andrew A. Rezin, and Michael L. Burgess

The goal of two-year technical programs is to prepare our students for viable careers in industry. Are we sure that we are adequately providing the knowledge and skills that are important today? How do we know? How can we be sure? These and other questions about related facilities and supporting equipment needs can only be answered by implementing a comprehensive validation of our programs.

At Columbus State Community College, a process and model was developed and implemented to assure that technical programs and individual course outcomes were meeting the needs of the industries being served. The process led the authors to conclude that program validation is a continual process, requires commitment, must include those persons responsible for the program and those affected by the program.

A technology program is considered validated when the student outcomes or competencies for the program and each course match the needs of the industry. This includes all general education, basic related, and technical related courses.

The authors believe that the program validation process must be connected to an operating unit's mission and definition for quality. Quality is meeting stated customer requirements. When we meet with the customer and establish the requirements in a measurable way, we have the criteria. As we work towards excellence through a never-ending improvement of our processes and systems, the word customer describes who our work goes to. The industry is the customer and output for our work.

Quality occurs when student outcomes meet the highest standards of the industries which the program supports. The two primary components that shape our quality efforts are the industries that our programs support and our student body. These components require that our curriculum and student outcomes reflect the demands of the industries and that the instructional delivery meets the needs of our students.

Student outcomes include competencies, technical skills and comprehension of fundamental relationships that pertain to the technology as well as the ability to communicate these relationship effectively. Several conditions enhance the attainment of student outcomes. These include faculty members' expertise and instructional delivery, preparation,

classroom and laboratory facilities, student access to all relevant resources such as lab equipment and faculty time, prompt and thorough feedback on assigned work throughout the course, and a course structured with appropriate measures of assessment to simulate the environment for which the course is preparing students to work.

As an on-going venture, a review of program validation efforts are continually made to quantify the highest standards of the industry supported by our program. These industry standards become the targets for our student outcomes.

Initial work on the program validation development originated from a request from one of the largest companies in Ohio, Honda of America. Honda requested that Columbus State Community College provide two new technology programs (Quality Assurance and Electromechanical Engineering Technology programs) to Honda employees on site at their Marysville and Anna, Ohio plants. The process used to develop the Honda programs and to validate existing programs is presented. The Graphic Communications and Automotive Technology programs are highlighted.

The process includes an industry assessment of the program and course outcomes or competencies using a questionnaire survey instrument, advisory committee review and personal contact. In addition, two DACUMs (Designing A Curriculum) were used to identify specific job skills and tasks appropriate for the program outcomes.

Using the outcomes based format, the representative industry was requested to complete a survey packet consisting of the program outcomes sheet, thirty-five individual course outcome sheets (including general, basic, and technical), and two questionnaire instruments about the company's job needs, equipment used, and anticipated future hiring practices. These components were bound into a single document for distribution to thirty companies representing the printing and publishing industry being served by the technology program. The reviewers simply checked *agree*, *modify*, or *delete* the outcome. Comments were requested if the *modify* column was checked. A six-quarter plan of study was also provided in the packet.

All surveys distributed for review were returned. Selected companies were visited by the faculty to obtain clarification on comments received. Companies were randomly selected from the membership of the following professional organizations:

Printing Industry of Central Ohio
In-Plant Printing Management Association
Columbus Club of Printing House Craftsman

The two DACUM panels were facilitated by The Ohio State University Center on Education and Training for Employment. Each panel consisted of eight industry experts. Separate competency profiles were identified for a Graphic Communications Technician and a Computer Graphics Specialist.

Two questionnaire instruments were also used, one at the beginning of the packet and the second as a summary following the individual outcome sheets. Questions were asked to obtain information regarding business demographics and also satisfaction with the program being offered. The respondents strongly agreed that:

1. The Graphic Communications Technology program properly prepares individuals for viable careers.
2. The course outcomes lead to the achievement of the overall student outcomes as listed in the college bulletin.
3. The math levels are sufficient to meet the needs of the industry.
4. The communication skill levels are sufficient to meet the needs of the industry.
5. Sixty-four percent of the respondents confirmed that computer utilization skill levels are sufficient. Sixteen percent disagreed. This disagreement was over software selected for individual courses and has since been modified to match industry standards.
6. The survey respondents confirmed that the student outcomes were appropriate and consistent with the industry needs. Suggestions for modification of the student outcomes included placing more emphasis on the digital part of the business.
7. The Advisory Committee agreed with the validation process and reviewed the data collected. The committee supported that the Graphic Communications Technology program is fulfilling its mission.

Since the outcomes for the Graphic Communications Technology program match the needs of the industry being served, the curriculum is considered validated. The validation process provided an accurate listing of job titles for graduates of the program.

The technical program validation and development process proved viable to confirm and identify areas for improvement to assure that the curriculum produces graduates capable of meeting the needs of industry. The process confirmed that the Engineering Technology programs were in compliance with the needs of the local industry. Collectively, the industry survey, DACUM profile, and advisory committee review provided the important inputs for validation of the program and identification of areas for improvement.

Results of the validation:

- Confirmed that the curriculum currently in place conformed to regional industry needs.
- Placed the overall program and each course within the program into an outcomes based format.
- Created an improved collegial atmosphere and working environment between faculty and administrators.
- Improved teamwork and morale among the instructional staff since they became an integral part of the validation process.
- Increased visibility and credibility for the program within the industry.
- Identified key companies and individuals who could function as recruiters and promoters for the technology program.
- Established a process where the program could be continually reviewed for identification of areas of improvement and upgrade.

It was decided that the program validation process should be revisited every three years to maintain currency with the latest technology. Ideally, we want to be on the cutting or leading edge of the discipline.

In December 1992, the Ohio Board of Regents issued a report titled "Securing the Future of Higher Education in Ohio." The report articulated the recommendations for a statewide Managing for the Future Task Force to maintain program quality while increasing access to higher education. Nine service expectations were endorsed in July, 1993 to provide a framework for evaluating the effectiveness of Ohio's two-year campuses.

The program validation process described provides a measure of performance for three of the nine service expectations with regards to technical programming. The three service expectations are:

1. To provide a range of career/technical programming preparing individuals for employment in a specific career at the technical or paraprofessional level;
2. To establish partnerships with industry, business, government, and labor for the retraining of the work force and the economic development of the community, and
3. To establish a high level of community involvement in the decision-making process in such critical areas a course delivery and range of services provided.

The program validation process directly involved the industry who would hire our graduates. The industry identified the specific working skills needed for employability of our graduates. The survey instrument served as a mechanism to enhance program awareness in the community. Program needs were quickly recognized by the industry. As a result the number of student scholarships were increased; a statewide education and recruitment committee was established; increased training for faculty

was further enhanced through a "Educate the Educators" annual scholarship; and the industry provided assistance in the form of donated equipment and opened their doors for student tours and faculty sabbaticals.

As educators, we have spent our lifetimes developing expertise to share our knowledge with students. We assume that we know what outcomes the industry expects of program graduates. Only by undertaking an improvement process like program validation can we assure ourselves and the community at large that a quality educational curriculum is being delivered. Program validation answers the question of accountability.